SNOW SAMPLING SURVEY
in the vicinity of
WILANOUR RESOURCES LIMITED, COCHENOUR

March, 1982

D. J. Racette
Plant Pathologist

H. D. Griffin
Chief, Air Quality Assessment

TECHNICAL SUPPORT SECTION
NORTHWESTERN REGION
ONTARIO MINISTRY OF THE ENVIRONMENT

December, 1983

INTRODUCTION

In November, 1981, Wilanour Resources Limited began rehabilitation work at its former gold producing property at Cochenour, near Red Lake, Ontario. Several test runs of ore and tailings were made through the company's mill. In April, 1983, these operations were suspended for economic reasons.

To document background conditions in the event the Wilanour mill commenced normal production, a snow sampling survey was carried out in the Cochenour area in March, 1982. Snow sampling is often useful in documenting the deposition of airborne contaminants around mining operations.

METHODS

Duplicate samples of snow were collected on March 3, 1982, from seven sites near Wilanour Resources Limited (Figure 1), plus two control sites remote from the study area. Core samples of the complete snow profile were obtained following standard Ministry sampling procedures (1). Meltwater samples were submitted to the Ministry's Thunder Bay laboratory for analysis of pH, conductivity, suspended solids, arsenic, and mercury. The Ministry's Toronto laboratory determined concentration of sulphate.

RESULTS AND DISCUSSION

Analytical results from the 1982 survey are summarized in Table 1. Concentrations of arsenic, mercury, suspended solids and pH in snow near the mill were much higher than control values. Some of the arsenic and mercury levels exceeded current contaminant guidelines by up to a factor of two. Levels of arsenic, mercury, suspended solids and pH decreased rapidly with increasing distance from the mill, thereby implicating operations at Wilanour Resources Limited as a contamination source. We suspect

that the elevated readings might have been caused by ore hauling and handling operations, and to wind blown particulate matter from the waste rock disposal site or tailings area. This contamination was restricted to a small area near company property. The distribution patterns for arsenic, mercury, and suspended solids around Wilanour were similar. Levels of sulphate and conductivity were low at all sites.

Trace quantities of black particulate matter were noted on the snow surface at site 2. Sample core depth averaged 60 cm (centimetres) and ranged from 55 to 70 cm.

Since the company terminated all activity on its property in April, 1983, no further monitoring is warranted. If production resumes at Wilanour, the need for further surveys will be assessed.

REFERENCE

1. Ontario Ministry of the Environment. 1983. Field investigation procedures manual, Phytotoxicology Section, Air Resources Branch.

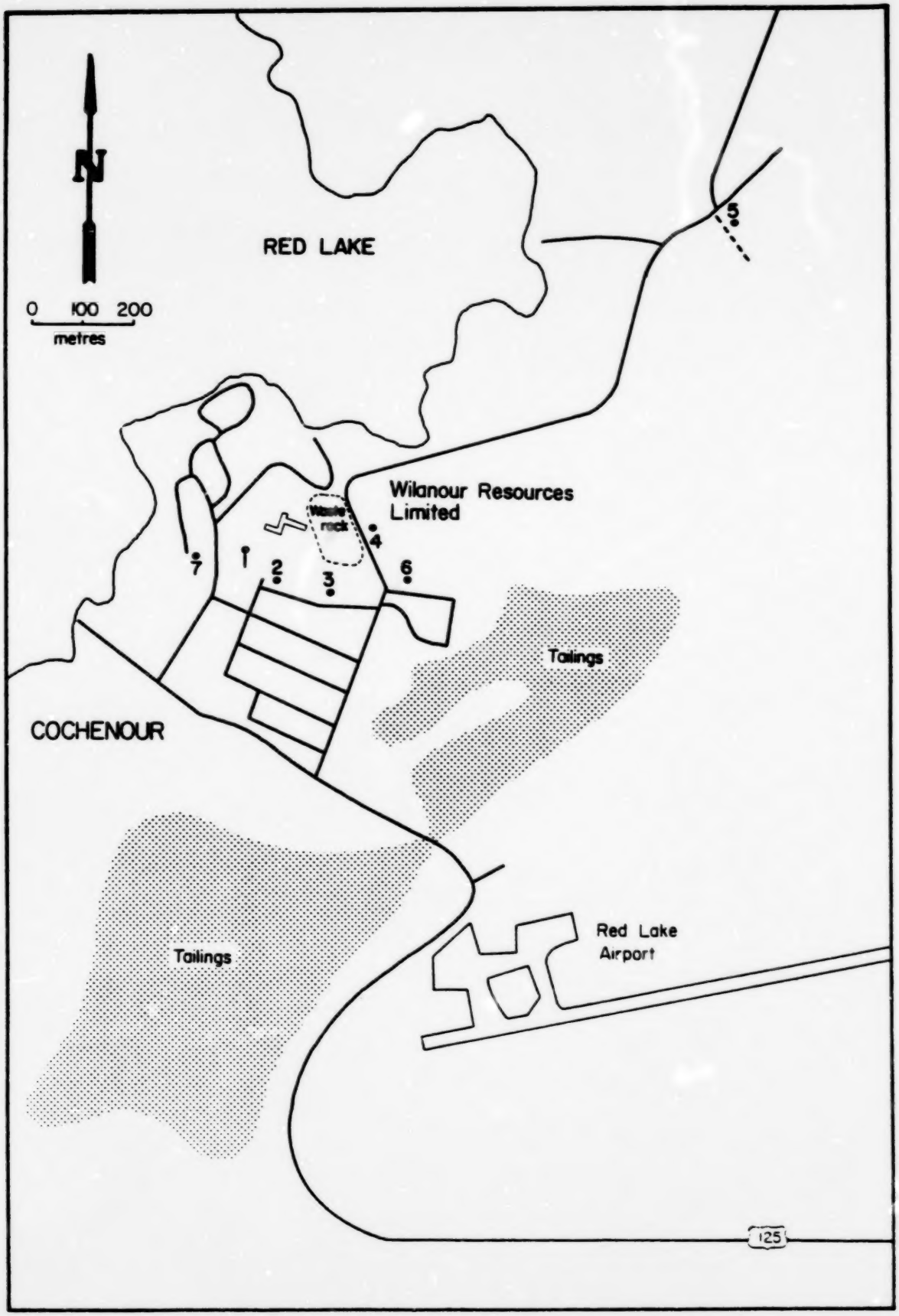

Figure I. Snow sampling sites, Cochenour, March, 1982.

TABLE 1. Levels of arsenic, mercury, sulphate, suspended solids, conductivity, and pH in meltwater from snow sampled in the vicinity of Wilanour Resources Limited, Cochenour, March 3, 1982.

Station	Arsenic (µg/ℓ)	Mercury (µg/ℓ)	Sulphate (mg/ℓ)	Suspended solids (mg/ℓ)	Conductivity (µmhos/cm)	pH
1	18	0.84	1.2	72	14	6.6
2	20	0.32	0.2	120	13	6.6
3	20	0.24	1.0	88	16	6.9
4	8	0.10	0.8	55	12	6.4
5	6	<0.05	0.7	16	7	5.1
6	18	0.53	0.9	28	8	5.6
7	4	<0.05	1.2	20	13	5.0
Controls	<1	<0.05	0.7	7	12	4.3
Normal background	<10	<0.50	<5.0	-	-	-